

Research Visit at the Ono Group, Kyoto University

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After a Masters' in physics, I did my Master Thesis in SPINTEC at the CEA of Grenoble (France). There, I learned the basics of spintronics physics and worked on metallic nanodevices and spin to charge interconversion in Rashba interfaces and topological insulators using Spin Pumping Ferromagnetic Resonance (SP-FMR).

As a part of the curriculum, I was required by my university to perform an internship abroad before starting a PhD in France. I already had an experience in working in Japan thanks to a three months internship that I performed in the spring of 2017 in the Kobayashi Group at Osaka University. Furthermore, my supervisor in SPINTEC has a long experience in working with Japanese researchers. He was able to help me find a group in which I could improve my knowledge in spintronics in order to gain more experience in the methods that could be used for my PhD project.

The aim of the project at Ono lab was the study of an Nb/V/Ta superlattice showing superconductivity below 3K. Due to its non-centrosymmetric structure, this material is believed to exhibit a bulk Rashba splitting leading to a spin to charge interconversion when flowing a charge current. Below the superconducting transition temperature, it is also expected to observe the formation of spin triplet cooper pairs. Since these cooper pair carry a net magnetic momentum, they may be used to apply a torque on a nearby ferromagnetic material. This material could consequently be used in superconducting spintronics, a growing field of research in which the Ono lab is involved.

During my internship, we measured the spin to charge interconversion and the torque generated by this superlattice by Spin Torque Ferromagnetic Resonance (ST-FMR) which is the reciprocal effect of SP-FMR. This provides me with an insight on a measurement technique that is not used by my research group at SPINTEC.

Beside learning new measurement techniques and working on material that are not familiar to me, I could have a deeper experience about life and culture in Japan. This experience gave me some insights on the possibility of pursuing my future research career in Japan.

I would like to acknowledge financial support from ICR, which covered housing in Uji. I also want to thank Prof. Ono for welcoming me in his group, and also the entire group for allowing me to work in a very friendly atmosphere.

